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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/065,979

12/05/2002

Sen-Hsiung Fan

7665-US-PA

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31561

7590

03/10/2005

JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE

7 FLOOR-1, NO. 100

ROOSEVELT ROAD, SECTION 2

TAIPEI, 100

TAIWAN

EXAMINER

RAO, SHRINIVAS H

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 03/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

| | | | | |
|------------------------------|------------------------|--|---------------------|--|
| Office Action Summary | Application No. | | Applicant(s) | |
| | 10/065,979 | | SEN_HUSING FAN | |
| | Examiner | | Art Unit | |
| | Steven H. Rao | | 2814 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/5/02 & 1/30/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

The Application as currently filed appears to not claim priority from any prior filed patent Application (as indicated by the absence of Foreign priority documents from the Application, the Oath/declaration will identifying an earlier filed Taiwanese Patent Application No. 90120810 filed on 08/24/2001 has also a cross mark indicating foreign priority is not claimed, lastly the palm does not indicate any claim to foreign priority) therefore presently the earliest available filling date is the U.S. filling date namely December 05, 2002.

Information Disclosure Statement

No IDS to date has been filed in the instant Application.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In independent claims 1 and 7 the phrase "so as to the second electrode, the dielectric layer and the second type doped layer forms a dielectric layer capacitor " renders the claim indefinite because it not clear what is included/ exclude by the phrase . Firstly it is not clear whether Applicants' mean the second electrode, the dielectric layer and the second type doped layer form a capacitor or mean something else because of the terms " so as to ". Secondly it not clear what Applicants' mean by the term "dielectric layer capacitor ". A capacitor is generally referred to as capacitor alone or any one of a junction capacitor, trench capacitor or stacked capacitor and therefore the prior art or knowledge of

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one ordinary skill in the art does not clarify what Applicants' intend to include/exclude by the recitation "dielectric layer capacitor. "

Further claims 1 and 7 recite " at least comprising" it is not clear what is included/ excluded by the expression, because "comprising" is a inclusive term that does not exclude the other elements and " at least" also indicates the presence of other elements. It is not understood what Applicants intend to include/exclude by the reciting two phrases " comprising" in conjunction with " at least".

In claims 1 and 7 line 8 the phrase " is corresponded to" it is not clear what is included/ excluded by the expression.

Dependent claims 2-6 and 8-12 are rejected for at least depending upon rejected independent claims.

Dependent claim 4 the phrase " wherein the material of the dielectric comprises SiO_x, SiN_x, ferroelectric and polymer " is not clear because Applicants' specification para 0026 seems to indicate that Applicants' mean "wherein the dielectric material is selected from the group consisting of " whereas the claims as presently recited requires all 4 and something else (comprising) .

Similarly Claim 5 the recitation " and partial of the charge of the dielectric layer capacitor is neutralized " is not clear as what is included/excluded.

Appropriate correction for all of the above is required.

The claim number(s) 11 and 12 and verb directed to neither a "process" nor a "machine," but rather embraces or overlaps two different statutory classes of invention set forth in 35 U.S.C. 101 which is drafted so as to set forth the statutory classes of invention in the alternative only. Ex parte Lyell, 17 USPQ2d 1548, 1551 (Bd. Pat. App. & Inter. 1990).

Claim 7 recites a device namely, " a photo sense element, at least comprising :a diode, wherein the diode comprises a first type doped layer, an intrinsic layer and a second type doped layer, the intrinsic layer is disposed in between the .first type doped layer and the second type doped layer the diode has a parasitic capacitor under a reverse bias state, a dielectric layer, wherein the dielectric layer is disposed on the first type doped layer of the diode; a first conductor layer, wherein the first conductor layer is disposed on the dielectric layer so as to the first conductor layer electrode, the

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dielectric layer and the first type doped layer forms a dielectric layer capacitor; and a second conductor layer, wherein the second conductor layer is disposed on the second type doped layer " while dependent claims 11 and 12 both recite method steps| operation mode steps , "wherein the operation mode comprises : before the photons are sensed, providing a first positive bias in between the first conductor layer and the second conductor layer to charge the dielectric layer capacitor to a first voltage, wherein when the photo sensing is processing, reducing the first positive bias, so as to the second diode processes the photo sensing under the reverse bias state, and partial of the charge of the dielectric layer capacitor is neutralized; and after the photons are sensed, providing a second positive bias in between the first conductor layer and the second conductor layer to charge the dielectric layer capacitor to the first voltage " and claim 12 , ""before the photons are sensed, providing a reverse bias in between the first conductor layer and the second conductor layer to charge the dielectric layer capacitor and the parasitic capacitor, and wherein when the photo sensing is processing, maintaining the reverse bias, so as to the diode processes the photo sensing under the no bias state and charges the dielectric layer capacitor continuously"

A claim/s which claim/s both an apparatus and method steps of using the apparatus is indefinite. Ex parte Lyell, 17 USPQ2d 1548 (Bd. Pat. App. & Inter. 1990).

Therefore claims 11 and 12 are indefinite .

Claim Objections

Claim s 1-12 are objected to because of the following informalities: Claims 11 and 12 recite , " ..wherein the operation mode " , the operation mode is not recited in

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independent claim 7 from which both 11 and 12 depend and therefore there is no proper antecedent basis for "the operation mode" . Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 -12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Den Boer et al. (U.S. Patent No. 6124606, herein after Boer) in view of Toyoshima et al. (U.S. Pre grant Pub. No. 2002/93474, now USP No. 6795,049 herein after Toyoshima)

With respect to claim 1, to the extent understood, Boer describes a photo sense element, at least comprising: a diode, (Boer col.2 line 48-49, fig. 4 # 73,) wherein the diode comprises a first type doped layer, (Boer col.2 line 49-layer 59) an intrinsic layer (Boer col. 2 line 49-layer 61) and a second type doped layer, (Boer col.2 line 50-layer 63) the intrinsic layer is disposed in between the first type doped layer and the second doped layer, (Boer figure 3 # 61 between 59 and 63) the diode has a parasitic capacitor under a reverse bias state; (Boer col. 2 lines 65-67) a first electrode, (Boer figure 4 # 87, col. 11 line 24) wherein the first electrode is electrically connected to the

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first type doped layer (Boer figure 4 # 89 , and 87 connected to 89) a second electrode, (Boer figs..1, # 4, 4 # 93) wherein the second electrode is corresponded to the second type doped layer (Boer figures 1# 4 , 4, # 93)

Boer does not specifically mention the capacitor structure as including a dielectric layer, wherein the dielectric layer is disposed in between the second electrode and the second type doped layer, so as to the second electrode, the dielectric layer and the second type doped layer forms a dielectric layer capacitor.

However Toyoshima , a patent from the same filed of endeavor, describes in para 0072 a capacitor structure a dielectric layer, (Toyoshima para 0072 line 9-10) wherein the dielectric layer is disposed in between the second electrode and the second type doped layer, (Toyoshima para 0072 lines 10-11) so as to the second electrode, the dielectric layer and the second type doped layer forms a dielectric layer capacitor. (Toyoshima para 0072line7) to avoid slight differences that occur in the stages of the shift register and the resulting instability of the .gate driver and provide constant signal characteristics in the first and second wires and dummy wires .

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include Toyoshima's capacitor structure (having dielectric layer between second electrode and second doped layer) for Boer capacitor structure . The motivation to make the above substitution is to avoid slight differences that occur in the stages of the shift register and the resulting instability of the gate driver and to provide constant

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signal characteristics in the first and second wires and dummy wires. (Toyoshima paras 0030 and 0031).

With respect to claims 2 and 3 to the extent understood, Boer describes the photo sense element of claim 1 , wherein the first type doped layer is N- type doped, the second type doped layer is P-type doped. (Boer col.2 lines 47-50)

With respect to claim 4 to the extent understood, Boer describes the photo sense element of claim 1 , wherein the material of the dielectric layer comprises Siox, SiNx, ferroelectric and polymer.(Boer col.2 lines 4-6).

With respect to claims 5 and 6 to the extent understood, Boer describes the photo sense element of claim 1, wherein the operation mode comprises before the photons are sensed, providing a first positive bias in between the first electrode and the second electrode to charge the dielectric layer capacitor to a first voltage ; (Boer col. 6 lines 26 to 42) wherein when the photo sensing is processing, reducing the first positive bias, (Boer col. 6 lines 45-53) so that the second diode processes the photo sensing under the reverse bias state, (Boer col. 6 line 46) and partial of the charge of the dielectric layer capacitor is neutralized, (Boer col.5 lines 60-65) and after photons are sensed, providing a second positive bias in between the first electrode and the second electrode to charge the dielectric layer capacitor to the first voltage. (Boer col. 2 lines 55-60).

With respect to claim 7 to the extent understood, Boer describes a photo sense element, at least comprising :a diode, (Boer col. 2 line 49-50) wherein the diode

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comprises a first type doped layer (Boer col.2 line 49-layer 59) an intrinsic layer and a second type doped layer, (Boer col. 2 line 49-layer 61) the intrinsic layer is disposed in between the .first type doped layer and the second type doped layer(Boer figure 3 # 61 between 59 and 63) the diode has a parasitic capacitor under a reverse bias state, (Boer col. 2 lines 65-67) a dielectric layer, wherein the dielectric layer is disposed on the first type doped layer of the diode; (Toyoshima para 0072 lines 10-11) a first conductor layer, wherein the first conductor layer is disposed on the dielectric layer, () so as to the first conductor layer electrode, the dielectric layer and the first type doped layer forms a dielectric layer capacitor; and a second conductor layer, wherein the second conductor layer is disposed on the second type doped layer.

With respect to claims 8 and 9 to the extent understood, Boer describes the photo sense element of claim 7, wherein the first type doped layer is N- type doped, the second type doped layer is P-type doped . (Boer col. 2 lines 48-53).

With respect to claim 10 to the extent understood, Boer describes the photo sense element of claim 7, wherein the material of the dielectric layer comprises Siox, SiNx, ferroelectric and polymer. (Boer col.2 lines 4-6).

With respect to claim 11 to the extent understood, Boer describes the photo sense element of claim 7, wherein the operation mode comprises : before the photons are sensed, providing a first positive bias in between the first conductor layer and the second conductor layer to charge the dielectric layer capacitor to a first voltage, wherein when the photo sensing is processing, reducing the first positive bias, so as to the

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second diode processes the photo sensing under the reverse bias state, and partial of the charge of the dielectric layer capacitor is neutralized; and after the photons are sensed, providing a second positive bias in between the first conductor layer and the second conductor layer to charge the dielectric layer capacitor to the first voltage.

It is noted that the limitations, "wherein the operation mode comprises : before the photons are sensed, providing a first positive bias in between the first conductor layer and the second conductor layer to charge the dielectric layer capacitor to a first voltage, wherein when the photo sensing is processing, reducing the first positive bias, so as to the second diode processes the photo sensing under the reverse bias state, and partial of the charge of the dielectric layer capacitor is neutralized; and after the photons are sensed, providing a second positive bias in between the first conductor layer and the second conductor layer to charge the dielectric layer capacitor to the first voltage " is taken to be an intended use , that recites with respect to the manner in which a claimed apparatus is intended to be employed (used) does not differentiate the claimed Apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Masham, 2USPQ2d 1647 (1987) .

Further as shown above under the rejection of claim 7 above all of the structural elements are obvious over the applied teachings of Boer and Toyoshima.

Assuming that Applicants' overcome the above objections Boer teaches/suggests in col. 6 lines 57 to 60 describes providing a first positive bias in between the first conductor layer and the second conductor layer to charge the dielectric layer capacitor to a first voltage, and in col. 6 lines 46 to 52 teaches/suggests

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so as to the second diode processes the photo sensing under the reverse bias state, and partial of the charge of the dielectric layer capacitor is neutralized and in col. 6 lines 46 to 53 suggests/teaches "and after the photons are sensed, providing a second positive bias in between the first conductor layer and the second conductor layer to charge the dielectric layer capacitor to the first voltage "

With respect to claim 12. to the extent understood, Boer describes the photo sense element of claim 7, wherein the operation mode comprises before the photons are sensed, providing a reverse bias in between the first conductor layer and the second conductor layer to charge the dielectric layer capacitor and the parasitic capacitor, and wherein when the photo sensing is processing, maintaining the reverse bias, so as to the diode processes the photo sensing under the no bias state and charges the dielectric layer capacitor continuously.


It is noted that the limitations, "before the photons are sensed, providing a reverse bias in between the first conductor layer and the second conductor layer to charge the dielectric layer capacitor and the parasitic capacitor, and wherein when the photo sensing is processing, maintaining the reverse bias, so as to the diode processes the photo sensing under the no bias state and charges the dielectric layer capacitor continuously" is taken to be an intended use , that recites with respect to the manner in which a claimed apparatus is intended to be employed (used) and does not differentiate the claimed Apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Masham, 2USPQ2d 1647 (1987) .

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Further as shown above under the rejection of claim 7 above all of the structural elements are obvious over the applied teachings of Boer and Toyoshima.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Steven H Rao whose telephone number is (571) 272-1718 . The examiner can normally be reached on Monday- Friday from approximately 7:00 a.m. to 5:30 p.m.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956. The Group facsimile number is (703) 308-7724.


03/05/05